A Guide to TracVision 4

user's guide

- Operating Instructions

KVH TracVision® 4

Satellite Television

TracVision 4

User's Guide

Congratulations on your choice of the TracVision 4, one of the most advanced automatic satellite tracking systems available today. This user's guide provides all of the basic information required to use this system and receive the satellite entertainment you want. Detailed installation, configuration, and maintenance information is provided in the *TracVision 4 Technical Manual*.

Throughout this manual, important information is marked for your attention by these icons:

A helpful tip that either directs you to a related area within the manual or offers suggestions on getting the highest quality out of your system.

An alert to important information regarding procedures, product specifications, or product use.

Information about installation, maintenance, troubleshooting, or other mechanical issues.

An electrical safety warning to help identify electrical issues that can be a hazard to either this KVH product or a user.

TracVision 4 Serial Number

This serial number will be required for all troubleshooting or service calls made regarding this product.

Direct questions, comments, or suggestions to:

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Click here to go to our state-of-the-art Customer Support web page...the fastest and easiest way to get all of your questions answered!

If you have any comments regarding this manual, please e-mail them to manuals@kvh.com. Your input is greatly appreciated!

QUALITY CERTIFIED SYSTEM ISO 9001

KVH Part # 54-0150-01 Rev. B

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1 — Introduction

This section provides a basic overview of the TracVision 4 system. It explains how the system works and describes the function of each component.

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1.1 TracVision 4 System Overview

A complete satellite TV system, illustrated in Figure 1-1, includes the TracVision 4 antenna connected to the switchplate, an IRD (satellite TV receiver), and a television set. The optional TV/SAT Switch allows you to select a satellite at the press of a button. A desktop or laptop computer is used to configure the system and conduct diagnostics.

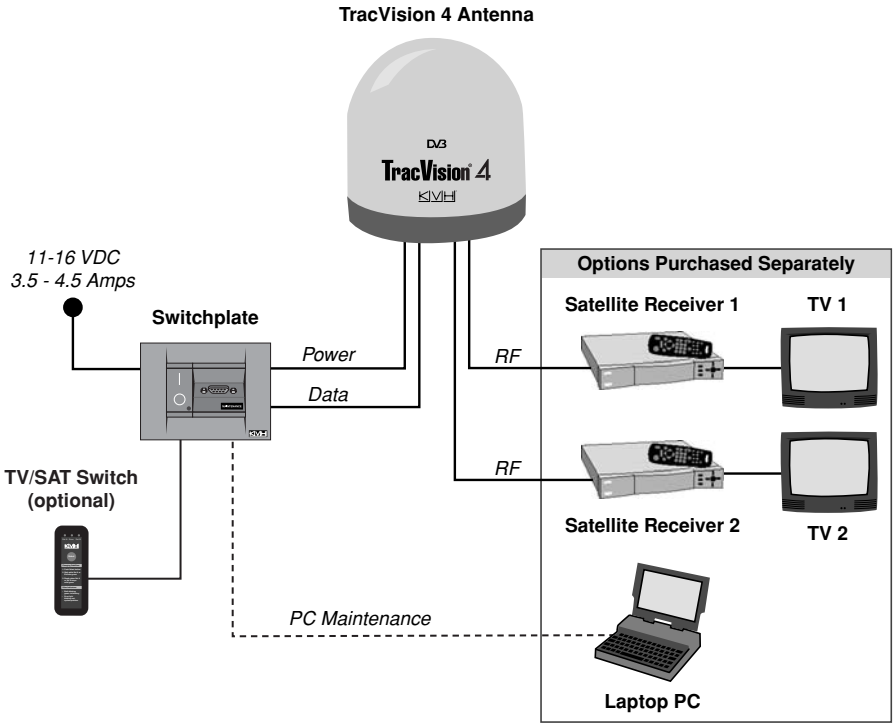
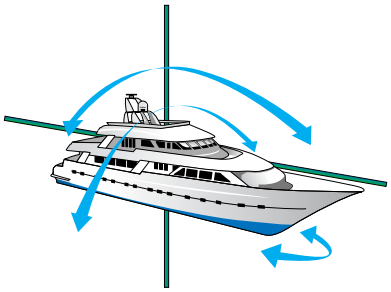


Figure 1-1
TracVision 4 System Diagram

System Compatibility

The TracVision 4 satellite antenna is fully compatible with Digital Video Broadcasting (DVB®) satellites, as well as DIRECTV®'s Digital Satellite Service (DSS) satellites. The system is also fully compatible with KVH's TracNet™ 2.0 Mobile High-speed Internet System (for more information about TracNet 2.0, please visit our web site at *www.kvh.com*).

Figure 1-2
TracVision Identifies and Compensates for Vessel Motion



In-motion Tracking

The TracVision 4 uses a state-of-the-art actively stabilized antenna system. Once the satellite is acquired, the antenna gyro continuously measures the heading, pitch, and roll of your vessel and sends commands to the antenna motors to keep the antenna pointed at the satellite at all times.

TracVision 4's default satellite pairs are:

N. America (US DIRECTV): DSS_101 & DSS_119

Europe: Astra 1 & Hotbird

Satellite Library

Your TracVision 4 includes a pre-programmed satellite library of North American and European satellite services. If the satellite service you wish to receive is not already in the satellite library, an authorized technician can add two additional satellites of your choice to the library.

Tables 1-1 and 1-2 list the possible satellite pairs that may be selected in North America and Europe. Contact the satellite TV service provider of your choice for complete details and a map of the service's coverage area.

Table 1-1
Available Satellite Pairs - North America (North American LNB required)

	DSS_101	DSS_119	Echo_61	Echo_110	Echo_119	Echo_148	Expressvu	ExpressTV
DSS_101		✓					✓	✓
DSS_119	✓						✓	✓
Echo_61				✓	✓		✓	✓
Echo_110			✓		✓	✓	✓	✓
Echo_119			✓	✓		✓	✓	✓
Echo_148				✓	✓		✓	✓
Expressvu	✓	✓	✓	✓	✓	✓		✓
ExpressTV	✓	✓	✓	✓	✓	✓	✓	

Table 1-2
Available Satellite Pairs - Europe (European LNB required)

	Astra 1	Astra 2N	Astra 2S	Hispasat	Hotbird	Sirius	Thor
Astra 1		✓	✓		✓	✓	
Astra 2N	✓				✓		
Astra 2S	✓				✓		
Hispasat							
Hotbird	✓	✓	✓			✓	
Sirius	✓				✓		✓
Thor						✓	

1.2 TracVision 4 Components

Your TracVision 4 system includes the following components:

Antenna Unit

The antenna unit houses the antenna positioning mechanism, low noise block (LNB), power supply, and control elements within a molded ABS radome. Weathertight connectors on the bottom of the baseplate join the power, signal, and control cabling from belowdecks units.

Switchplate

The switchplate controls power to the antenna via the On/Off switch. It also provides a DB9 maintenance port for connecting a computer or TV/SAT Switch for changing satellites and configuring the system.

Integrated Receiver Decoder (IRD) *(Satellite TV Receiver)*

The IRD (purchased separately) receives satellite signals from the antenna unit for signal processing and channel selection, and sends the signals to the TV set for viewing. Please refer to the user's manual provided with your selected IRD for complete operating instructions.

2 — Using Your TracVision 4

This section explains everything you need to know to operate your TracVision 4 system. Antenna unit initialization and satellite acquisition are automatic, making the system very easy to use.

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2.1 Receiving Satellite Signals

For TracVision 4 to receive satellite TV signals, the antenna must have a clear line of sight to the satellite. If you only receive intermittent signals or the antenna cannot find the satellite, check around your vessel for any objects that could be blocking the signal, such as other vessels, trees, buildings, other onboard equipment, etc.

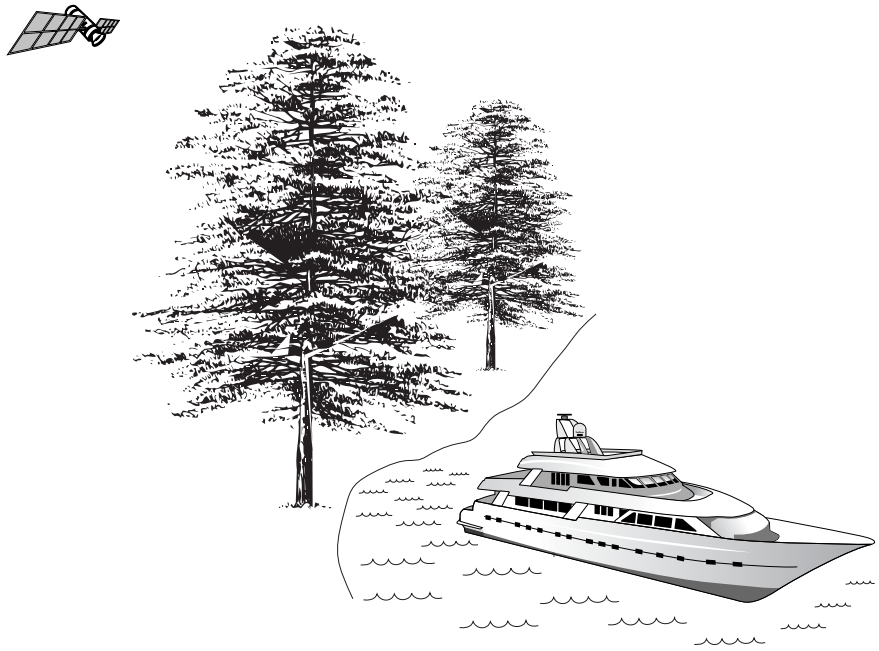


Figure 2-1
Be Aware of Objects that Might Block the Satellite Signals

You must also be located within the selected satellite's coverage area in order to receive its signal. Refer to your satellite television service manual to check the viable coverage area. *For your convenience, KVH provides links to several web sites that offer satellite coverage information. Simply go to our web site at: www.kvh.com/footprint.*

To minimize the time it takes the antenna to acquire the satellite, do not change the channel during the startup process or cable unwrap.

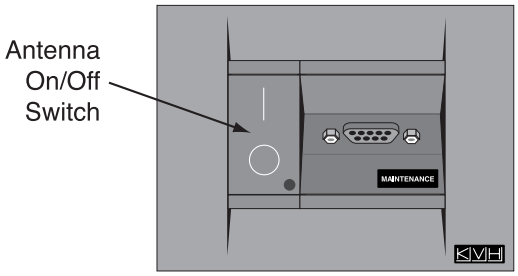
2.2 Turning On the System

The TracVision 4 system is easy to use. Antenna unit initialization and satellite acquisition are completely automatic.

To use the TracVision 4 system, follow the steps below.

1. Turn on the IRD and the television. (Refer to your IRD user's manual for complete operating instructions for the IRD.)

Figure 2-2
Switchplate On/Off Switch



2. Turn on the antenna using the switchplate's On/Off switch.
3. Avoid turning the vessel for 60 seconds after turning on the antenna to allow the antenna gyro to initialize properly.

2.3 Changing Channels and Switching to the Second Satellite

If you have followed the installation instructions, your system should be set to the active satellite pair of your choice and the system should have downloaded the appropriate channel guides. You must also have a properly configured IRD (if this has not been done, refer to your IRD User's Manual for instructions for your specific IRD).

Your TracVision system is programmed to track either of two satellites, stored in memory as Satellite A and Satellite B. You can use the IRD remote control, the optional TV/SAT Switch, or a PC to select between the two satellites.

Using the IRD Remote Control to Switch Between Satellites

When the TracVision 4 system and the IRD have matching configurations, switching from one satellite to the other is as easy as changing the channel using the remote control. TracVision 4 will automatically switch from Satellite A to B and back again as necessary to receive your selected channel.

DIRECTV Satellite Subscribers

DIRECTV subscribers in certain regions of the United States will require a DSS Plus IRD to receive broadcasts from multiple satellites.

If connected to the antenna's RF1 connector, the DSS Plus IRD allows you to switch channels using the IRD remote control. If you are a DIRECTV subscriber, but do not have a DSS Plus IRD, or you are using a multiswitch, use the optional TV/SAT Switch* or a PC, as described in the following sections.

EchoStar and ExpressVu Satellite Subscribers

EchoStar and ExpressVu subscribers will need to use the optional TV/SAT Switch* or a PC to change satellites, as described in the following sections.

** To order a TV/SAT Switch (KVH Part Number 01-0245), please call +1 401 847-3327.*

The satellite configuration on your IRD must match the satellite setting on the TracVision 4 system.

*Satellite A on the TracVision 4 must be the same satellite as IRD Alternative 1 (or A, based on your IRD) and must be assigned the IRD DiSEqC 1 setting.**

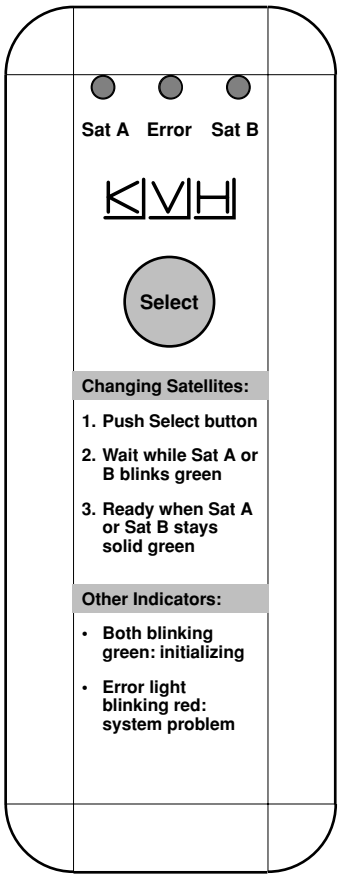
*Satellite B on the TracVision 4 must be the same satellite as IRD Alternative 2 (or B, based on your IRD) and must be assigned the IRD DiSEqC 2 setting.**

Refer to your IRD user manual for complete instructions for your IRD.

**DiSEqC settings only apply to European systems and DIRECTV DSS Plus™ IRDs.*

When you switch from one satellite to another, all IRDs connected to the system will receive signals from the newly selected satellite.

Figure 2-3
TV/SAT Switch



Using the TV/SAT Switch to Switch Between Satellites *- Optional*

If you are unable to switch between satellites using the IRD remote control, you can use the optional TV/SAT Switch (see Figure 2-3) to easily select between Satellite A and Satellite B.

TV/SAT Switch Controls and Indicators

The Select button is used for all operator controls. The TV/SAT Switch also has three LED indicators that show its current status. Table 2-1 explains the function of each indicator.

Table 2-1
TV/SAT Switch LED Indicators

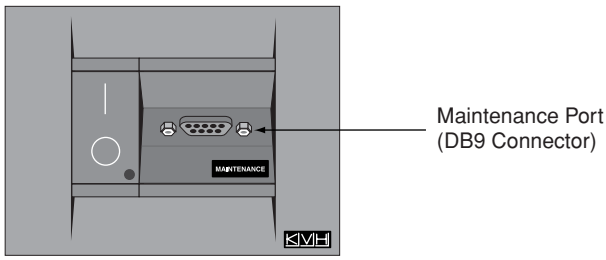
Indicator	Status	Meaning
Sat A	Blinking green	Wait – Searching for satellite
	Solid green	Tracking Satellite A
Error	Blinking red	System problem – *Refer to* Section 3, "Troubleshooting," *to find the possible cause*
Sat B	Blinking green	Wait – Searching for satellite
	Solid green	Tracking Satellite B

Connecting the TV/SAT Switch

To use the TV/SAT Switch, you must first connect it to the TracVision system.

1. Connect the TV/SAT Switch's data cable to the maintenance port on the switchplate (see Figure 2-4).

Figure 2-4
Switchplate Maintenance Port



2. The Sat A and Sat B indicators blink while the system initializes.
3. Either the Sat A or Sat B indicator will turn solid green, denoting which satellite is currently being tracked.

Using the TV/SAT Switch

The TV/SAT Switch is controlled via the single Select button. To select the second satellite, perform the following steps:

1. Press the Select button on the TV/SAT Switch.
2. The indicator for the current satellite (Sat A or Sat B) extinguishes, while the indicator for the other satellite starts blinking.
3. Once the indicator for the other satellite turns solid green, the TracVision system is tracking the newly selected satellite. You can now use your IRD to choose a channel on the new satellite.

Using a PC to Switch Between Satellites

If you're unable to switch between satellites using the IRD remote control, and you don't have a TV/SAT Switch, you can use a PC connected to the maintenance port. The procedure requires terminal emulation software such as Windows Hyperterminal. Use the settings appropriate to your application.

To switch satellites using a PC, perform the following steps:

1. Connect one end of the PC data cable to the DB9 connector on the switchplate. Connect the other end to the serial port on your PC (a 9-pin/25-pin connector adapter may be needed for some PCs).
2. Open the terminal emulation software and establish the following settings:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
3. Once the data connection is made, enter the Satellite Selection command as follows:

Command:	**@L,A or B<cr>** *(<cr> indicates a carriage return/ENTER key)*
Where:	A = track Satellite A B = track Satellite B

4. The antenna unit shifts to track the second satellite.

2.4 Watching Television

TracVision 4 allows you to watch satellite TV whether your vessel is in motion or at rest.

Cable Unwrap

The antenna can rotate a full 720° before reaching the end of its cable. If it does so, the system automatically unwraps the cable by quickly rotating the dish in the opposite direction. During this time, your television transmission will freeze momentarily while the cable unwraps and the antenna reacquires the satellite.

Conical Scan Tracking

The antenna uses conical scanning to maintain peak signal strength to the receiver and to update the satellite's position. When conical scan tracking is active, the antenna moves continually in a circular motion to sweep across the satellite's peak signal. The signal strength is then fed back to the control circuits to keep pointed in the direction of the strongest signal.

If the satellite signal is lost while the system is in conical scan track mode, the control software imposes a 45-second time-out delay. If the signal is not regained during that time, the antenna will search for the satellite signal. This is an automatic process that does not require user intervention.

Sleep Mode

When the vessel has come to a stop and holds its position for one minute (e.g., at a dock), the antenna unit enters Sleep Mode, which locks the antenna in place to conserve power. As soon as the vessel moves beyond a 1° - 2° window, or the RF level changes significantly, Sleep Mode automatically turns off and the system begins tracking the satellite again (or enters Search mode to find the satellite).

KVH recognizes that some customers may not want to take advantage of this convenient feature. In this case, it is possible to disable Sleep Mode using a simple software command as follows:

1. Connect a laptop computer to the system using the maintenance port and a terminal emulation program, as described in *"Using a PC to Switch Between Satellites" on the previous page.*

2. Turn on the antenna. When the limit switch test is complete:
   a. Type **HALT<cr>** *(<cr> indicates a carriage return/ENTER key).*
   b. Type **DEBUGON<cr>**.
   c. Type **SLEEPOFF<cr>**.
3. Cycle the antenna's power. Sleep Mode is now disabled.
4. To reactivate Sleep Mode, follow this same process, except type **SLEEPON<cr>** in Step c.

2.5 Internet Access

Your TracVision 4 can receive high-speed Internet data when used in conjunction with KVH's TracNet 2.0 Mobile High-speed Internet System. With TracNet 2.0, you get broadband Internet access on the move via satellite downloads and a wireless return path. For more information about TracNet 2.0 in North America and Europe, please visit our web site at *www.kvh.com*.

3 — Troubleshooting

This section identifies basic trouble symptoms and lists their possible causes and solutions.

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3.1 Troubleshooting Matrix

The troubleshooting matrix shown in Table 3-1 identifies some trouble symptoms, their possible causes, and references to troubleshooting solutions.

Table 3-1
Troubleshooting Matrix

Key
1 = Anyone can do
2 = Electronics know-how recommended
3 = Dealer service recommended

SYMPTOM / POSSIBLE CAUSE (AND SOLUTION)	Blown fuse, low power, or improper wiring	Vessel turning during startup	Incorrect satellite configuration	Satellite signal blocked	Satellite coverage issue	Radar interference	Satellite frequency data changed	Incorrect or loose RF connectors	Type of multiswitch used	IRD faulty or improperly configured (Section 3.3)	Antenna gyro faulty (Section 3.4)	LNB assembly faulty (Section 3.4)
	Section 3.2											
Antenna non-functional	1											
Antenna not switching satellites	1		1	1	1			2	2	2		2
No picture on TV set				1	1	2		2	2	2		2
Certain channels do not work	1			1	1		3	2		2		2
Intermittent picture for short intervals		1		1	1	2		2	2		3	2
System works at dock but not on the move				1							3	
System will not find satellite	1	1	1	1	1	2	3	2	2	2	3	2
Snowy television picture	1							2		2		
Pixelating television picture	1			1		2		2		2	3	2

If you need help troubleshooting your system, please contact an authorized KVH dealer. To find an authorized dealer near you, visit www.kvh.com*, or contact KVH directly at the numbers provided on the first page of this manual.*

3.2 Causes and Remedies for Common Operational Issues

There are a number of common issues that can affect the signal reception quality or the operation of the TracVision 4. The following sections address these issues and potential solutions.

Blown Fuse, Low Power, or Wiring

If the antenna unit is installed but entirely non-responsive, there are three key factors to check as part of the troubleshooting process:

Blown Fuse

With the system powered on, move the antenna reflector slowly by hand. If the reflector does not move freely, a fuse is not the problem. If the reflector does move freely, one of the two fuses mounted on the CPU Board may have blown or been broken. The *TracVision 4 Technical Manual* provides detailed instructions for authorized service personnel who may be required to replace a fuse. Contact your local KVH dealer or service center for assistance.

Low Power

If the power cable to the antenna unit is more than 50 ft (15 m), the power levels can decrease over the course of the cable, resulting in a voltage or current level at the antenna unit that is too low to power the system properly. The *TracVision 4 Technical Manual* provides detailed instructions for supplying adequate power to the antenna unit. Contact your local KVH dealer or service center for assistance.

Wiring

If the system has been improperly wired, it will not operate correctly. The *TracVision 4 Technical Manual* provides detailed instructions for authorized service personnel who may be required to check the wiring. Contact your local KVH dealer or service center for assistance.

Vessel Turning During Startup

If the vessel turns during the 60-second startup and initialization sequence that occurs immediately after turning on the power to the TracVision 4, the antenna gyro will record that variable motion as "standing still." This may cause the antenna to track improperly. To solve this problem, turn TracVision 4 off for at least 10 seconds. Turn the system back on, making certain that the vessel is either motionless or traveling in a straight line for the 60 seconds immediately following power-up.

Incorrect Satellite Configuration *(European Systems Only)*

The satellite configuration on European IRDs must match the satellite settings on the TracVision 4 system.

- Satellite A on the TracVision 4 must be the same satellite as IRD Alternative 1 (or A, based on your IRD) and must be assigned the IRD DiSEqC 1 setting.
- Satellite B on the TracVision 4 must be the same satellite as IRD Alternative 2 (or B, based on your IRD) and must be assigned the IRD DiSEqC 2 setting.

Refer to your IRD user manual for complete instructions on configuring your IRD.

Satellite Signal Blocked

Satellite signals can be blocked or degraded by buildings, other vessels, or equipment on the vessel itself. Simpy moving the vessel or obstruction will clear the signal.

Satellite Coverage Issue

TracVision 4 will provide outstanding reception within the 18" (45 cm) antenna coverage area for your satellite television service of choice. However, reception can be degraded as you approach the fringe coverage areas. Refer to your satellite television service manual to check the viable coverage area for a 18" (45 cm) antenna.

For your convenience, KVH provides links to several web sites that offer satellite coverage information. Simply go to our web site at www.kvh.com/footprint.

Radar Interference

The energy levels radiated by radar units can overload the antenna's front-end circuits. Check with your installer to make certain that the TracVision 4 antenna unit is in the optimal location with regard to your radar unit.

Satellite Frequency Data Changed

If some channels work while one or more other channels do not, or if the antenna is unable to find the satellite, the selected satellite's frequency data may have changed. This frequency data can be updated via the maintenance port. Contact your local KVH dealer or service center for assistance.

Incorrect or Loose RF Connectors

A loose RF connector can reduce the quality of the satellite signal. Also, if you cannot switch satellites using your IRD remote, your IRD may be connected to the wrong antenna baseplate connector. The *TracVision 4 Technical Manual* provides instructions for authorized service personnel who may need to check the RF connections. Contact your local KVH dealer or service center for assistance.

Type of Multiswitch Used *(North American Systems Only)*

An active (not passive) multiswitch must always be used to connect the TracVision 4 system to multiple IRDs. Contact your KVH dealer or service center for assistance.

3.3 IRD Troubleshooting

The IRD that was provided with your satellite television service may also be the cause of less-than-ideal operation. First check the IRD's configuration to ensure it is set up for the desired programming. In the case of a faulty IRD, refer to your IRD user's manual for service and warranty information. If the IRD is both configured properly and fully functional, contact your local KVH dealer or service center for assistance.

3.4 Antenna Gyro and LNB Faults

The *TracVision 4 Technical Manual* provides detailed instructions for authorized service personnel who may be required to replace the antenna's gyro or Low Noise Block (LNB). Contact your local KVH dealer or service center for assistance.

KVH Industries Limited Warranty
TracVision 4

Limited Warranty on Hardware

KVH Industries, Inc. warrants the KVH product purchased against defects in materials for a period of TWO (2) years and against factory labor costs for a period of ONE (1) year from the date of original retail purchase by the original purchaser. It is the customer's responsibility to verify the date of purchase by returning the warranty card included with the product to KVH within 30 days of purchase, or by providing a copy of a dated sales receipt for the KVH product under warranty with the warranty claim. If this date cannot be verified, the warranty period will begin 30 days after the date of manufacture of the original product purchased.

If you discover a defect, KVH will, at its option, repair, replace or refund the purchase price of the product at no charge to you, provided you return it during the warranty period, transportation charges prepaid, to the factory direct. Please attach your name, address, telephone number, a description of the problem and a copy of the bill of sale or sales receipt as proof of date of original retail purchase, to each product returned to warranty service. Alternatively, you may bring the product to an Authorized KVH dealer/distributor for repair. During the first year, and if the product was installed by an Authorized KVH dealer/distributor (identified with the KVH Authorized dealer/distributor list), KVH will cover the dealer's/distributor's labor charges for warranty repairs, provided the dealer/distributor contacts KVH for pre-approval of the charges. Approval of charges is at KVH's sole discretion.

This Limited Warranty does not apply if the product has been damaged by accident, abuse, misuse or misapplication or has been modified without the written permission of KVH; if any KVH serial number has been removed or defaced; or if any factory-sealed part of the system has been opened without authorization.

Return Authorization

A Return Material Authorization is required prior to returning the product to KVH Industries. Please call our Technical Support Department at +1 401 847-3327 or send an e-mail to techs@kvh.com to obtain the RMA number. Write the number in large, clear characters on the outside of the box. To avoid confusion and misunderstandings, shipments without an RMA number clearly visible on the outside box will be refused and returned to you at your expense. If possible, use the original box and packing material to protect the equipment from damage in shipment. KVH assumes no responsibility for warranty shipments from the customer to the factory if not shipped in the manner prescribed above.

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If any implied warranty, including implied warranties of merchantability and fitness for a particular purpose, cannot be excluded under applicable law, then such implied warranty shall be limited in duration to ONE (1) YEAR from the date of the original retail purchase of this product by the original purchaser.

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